

**“HIV Seropositivity in high risk
individuals and in patients of
pulmonary tuberculosis”**

THESIS
FOR
DOCTOR OF MEDICINE



BUNDELKHAND UNIVERSITY
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2005

VINOD KUMAR

DEDICATED

TO

MY LATE

FATHER

DEPARTMENT OF MEDICINE
M.L.B.MEDICAL COLLEGE, JHANSI

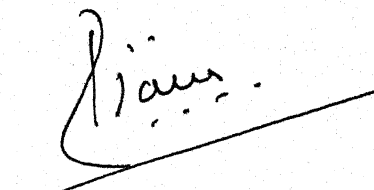
CERTIFICATE

This is to certify that the work entitled "**HIV Seropositivity in high risk individuals and in patients of pulmonary tuberculosis**" which is being submitted as a thesis for M.D. (Medicine) examination 2005 of Bundelkhand University has been conducted by **Dr. Vinod Kumar** in the department of Medicine M.L.B. Medical College, Jhansi.

He has put in the necessary stay in the department as per university regulations.

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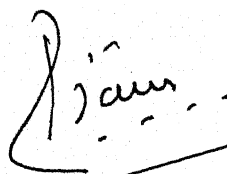
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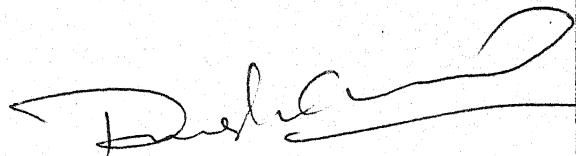
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Dated :

25/09/04

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INTRODUCTION

INTRODUCTION

Who could have predicated the dreadful effect of HIV epidemic, around the world, when AIDS was first recognized in USA? Who could have perceived that the face of tuberculosis would change so much and with such frightening speed?

Even in adequate developed country like USA, where till 1985. 6% annual decline in tuberculosis was achieved over preceding 30 years, a reversed trend of increase by 3-6% has occurred. HIV infection is cited as one of the major causes. Naturally, scenario for tuberculosis is far more grim in places like Sub Saharan Africa which are in grip of HIV infection and where tuberculosis has been endemic. South East Asia, especially India, is vying for top honours for HIV infection and will soon face similar dual problem of same magnitude.

CD4 lymphocytes and macrophage dysfunction in HIV infected patients places them at a high risk for both primary and reactivation tuberculosis. Within 3 years of the description of AIDS in 1981, increased incidence of tuberculosis in AIDS afflicted was reported.

Today Human Immuno Deficiency Virus and Mycobacterium tuberculosis collectively make an explosive mixture. HIV induced immuno suppression favours reactivation

of tuberculosis in those who are latently infected and increases the risk of disease among those who are newly infected. Therefore, it is not surprising that in many countries the increase in cases of AIDS parallels the increase in the case of HIV related tuberculosis.

TB is the only AIDS related opportunistic infection that significantly impacts upon people who are not infected with HIV worldwide, over the years to the millennium, the spread of the AIDS virus will result in more than 3 million new TB cases among both HIV positive and HIV negative individuals.

TB shortens the life expectancy of HIV- positive people because it takes hold at an earlier stage of immune deficiency than most other opportunistic infections: TB also tends to be a more aggressive disease in HIV- positive people. It is more often fatal and, if left untreated, can kill them in matter of weeks or months rather than the years it typically takes to kill someone who is HIV negative.

The clinical presentation depends on the stage of HIV infection, but overall 75% will have pulmonary manifestation. Patients early in the course of HIV disease with relatively preserved cell mediated immunity present with clinical – radiographic features indistinguishable from those in the population at large, in contrast to patients with advanced HIV disease which present in an atypical fashion and more than

60% will have extra pulmonary sites of infection, with lymphatic disease being most common.

MDRT is already a problem to reckon with by 1992, 6 outbreaks of MDRT in hospitals and AIDS facilities are on record, involving 5-65 patients in each outbreak. Not only these outbreak affected HIV positive inmates of hospitals and AIDS facilities but also involved health care workers, guards and family members.

Global AIDS policy coalition projects over million people are living with HIV in the developing countries and the figure may cross 100 million by year 2000 AD. Rapid increase of HIV infection in India, Thailand, Myanmar has raised concern that HIV / epidemic in this part of the world would have few rivals in the world. Suffice it to say that the deadly duo of HIV and TB is all set to become the " Scourge of the Century".

Important development is the spread in most Sub Saharan African countries of HIV infection from large cities to rural areas which contain the majority of the population. This is an extremely unfavorable development for TB control since excess incidence of tuberculosis caused by HIV infection will affect rural areas where case finding and treatment of TB are very difficult. Such a scenario seems now to be recurring in India which has every grim portends given the fact that 80% of its population is still residing in rural areas.

Keeping this grim scenario of future trends in mind coupled with the limited resources at our disposal, this study was planned to screen HIV seropositivity in all patients of pulmonary and extra pulmonary tuberculosis admitted in this hospital and attending the OPD of this hospital.

A part from this work in our department (department of Medicine M.L.B. Medical College, Jhansi). Else where seem to indicate that certain individual groups for example, commercial vehicle driver (especially truck drivers), drug addicts, person inmates, doctors, paramedical professionals, commercial sex workers, inmates of mental hospitals etc. have an increased proclivity for HIV seropositivity. Hence this study also intends to highlight the increased proclivity of HIV seropositivity in these certain individual groups.

AIMS
&
OBJECTIVE

AIMS AND OBJECTIVES

1. To Study HIV seroprevalence in patients of pulmonary tuberculosis & extrapulmonary tuberculosis of population of Bundelkhand region.
2. To study certain individuals groups who are at high risk of developing HIV infection due to profession or life style such as commercial vehicle driver (Truck drivers) drug addicts, Jail inmates, spouses and children of HIV positive homo and heterosexual.

MATERIAL

AND

METHODS

MATERIAL AND METHODS

The present work was undertaken to study the HIV seropositivity in high risk individuals (Truck drivers, Jail inmates, children spouses of HIV positive homosexual etc) and in patients of pulmonary & extra pulmonary tuberculosis of population of Bundelkhand region, with radiographic features frequently coexisting with HIV, Trend of association between the cases of pulmonary tuberculosis and extra pulmonary tuberculosis and HIV infection.

RESEARCH SETTING

The study was conducted in the Department of Medicine, Department of T.B. & Chest, Department of Dermatology and Sexual Diseases, Blood Bank, Department of Microbiology of M.L.B. Medical College, Jhansi.

STUDY POPULATION

1. Patients of pulmonary & extra pulmonary tuberculosis admitted in Medicine ward, T.B. & chest ward, OPD of M.L.B. Medical College, Jhansi.
2. High risk individuals & Truck drivers, Jail inmates' spouses & children of HIV positive individual etc through Hospital and Camps.
3. Patients with certain Not known tuberculosis & extra pulmonary tuberculosis conditions admitted to this hospital which are often associated with HIV infection e.g. Herpes Zoster, Oral Thrush, Chronic Diarrhea, Non Specific Adenitis, Meningitis etc.

PERIOD OF STUDY

May 2003 to August 2004.

STUDY SAMPLE

The study comprised of 282 patients of pulmonary tuberculosis & extra pulmonary tuberculosis.

CRITERIA

The criteria for selection of patients was as follows:

A. Pulmonary Tuberculosis with following radiographic presentation

- Mediastinal Lymphadenopathy
- Not known Cavity Local Focal Infiltrates
- Lower Lung fields infiltration
- Miliary shadows
- Pleural effusion
- Cavitory lesion in different lung fields

B. Extra Pulmonary Tuberculosis

- Chest X- ray (PA view and /or Lateral view)
- Smear examination for AFB from secretion.
- Thoracocentesis and pleaural biopsy (m as and when required)
- Culture for M- tuberculoisi from secretion or tissue (as and when required).
- FNAC of the suspected lesion of site
- CSF for tubercular meningitis patients

METHOD FOR DETECTING HIV INFECTION

Blood was withdrawn by venipuncture from all the patients of pulmonary tuberculosis by aseptic methods. Blood withdrawn was transferred in adequate sterile vial containing Not known anticoagulant. Blood in the vial was kept for few hours and then subjected to centrifugation at 2500 rotation / min for 10 min. The serum thus obtained was again kept in adequate fresh, plain sterile vial and transported to HIV detection lab. The sample was subjected to ELISA Test for HIV (it noted HIV-1/HIV-2 Ab S.P.) and if the test was positive, it was repeated.

DATA COLLECTION

Case sheet was prepared to get information of place of residence. a medical history was taken from each person specifically includes question about previous treatment for tuberculosis, h/o suggestive of HIV infection including past herpes Zoster, Chronic Diarrhoea and to categories of patients who are at high risk for HIV infection such as heterosexual promiscuous (Prostitutes, patients attending STD clinical). Homosexual HIV drug abusers, professional blood donors, recipients of blood & blood product, patients on dialysis suspected ARC / AIDS patients, relatives of AIDS patients.

A through physical examination was performed on each patient with particular attention to presence of generalized lymphadenopathy, oral or other manifestation of HIV infection. Like general pruritic dermatitis. Oropharyngeal candidiasis, Chronic progressive or disseminated , Herpes Simplex and Kaposi Sarcoma.

All patients included in study group was subjected to ELISA (Enzyme Linked Immuno Sorbent Assay) for HIV antibodies, the diagnosis of tuberculosis by, history, examination, sputum for AFB, FNAC & CXR, Chest X-ray was looked for any atypical & typical radiological presentation prior to ELISA test.

INVESTIGATIONS

Both patients of pulmonary & extra pulmonary tuberculosis asymptomatic individuals were subjected to the following investigations.

- i. Haemogram- Hb, TLC, DLC
- ii. Urine examination- Sugar, Albumin and microscopy.
- iii. Tuberculin Skin Test.
- iv. Sputum for AFB.
- v. X-ray chest P/Adequate view and other views if indicated.
- vi. FNCA (Biopsy if indicated).
- vii. Other investigation blood Sugar , Serum Creatinine etc if needed.
- viii. Immuno dot assay test for HIV in all cases.
- ix. ELIS test for HIV those cases who are positive by immuno dot assay test negative but with highly suspicious clinical features. It was carried in AIDS unit department of Microbiology M.L.B. Medical College, Jhansi.

SAMPLE

Serum of plasma was used for testing specimens was stored at 2-80 C. grossly haemolysed and contaminated sample will not be used

ELISA TEST FOR HIV

This test was done in department of Microbiology , AIDS unit , M.L.B. Medical College, Jhansi .

IMMUNO DOT ASSAY FOR HIV

The kit used for immuno dot assay test

Principle Dot Immuno Assay employs the binding of coloured particles of colloidal gold to visualize the immobilized complex. The circular spot on each tooth of the polystyrene comb is coated with a critically standardized amount of HIV 1 & HIV-2 recombinant and synthetic peptides. When incubated with adequate specimen contains HIV-1 & HIV-2 antibodies. These antibodies bind specifically to the peptide antigen. The antibodies – peptide is directly visualized after incubation with the protein- colloidal gold single reagent. Adequate positive result is indicated by the surface of the comb where peptides have been spotted.

2

REVIEW
OF
LITERATURE

REVIEW OF LITERATURE

INTERNATIONAL EPIDEMIOLOGY

HIV infection / AIDS is a global pandemic, with cases reported from virtually every country. The current estimate of the number of cases of HIV infection among adults world wide is approximately 30 million, and among children it is approximately 1.1 million at the end of 1997. The WHO estimates that approximately 2.6 million HIV infected children have been born since the start of the HIV pandemic, and approximately half of these have developed AIDS and have died. The global projections for the total number of HIV infected individuals by the year 2000 AD ranges from 40-100 million. The HIV epidemic has occurred in "waves" in different regions of the world, each wave having somewhat different characteristics depending on the demographics of the country and region in question and the timing of introduction of HIV in to the population.

The actual reported cases of AIDS world wide are a gross under estimate of the true prevalence, mainly because the incomplete reporting system in certain developing countries.

Worldwide, the Joint United Nations Programme on HIV / AIDS (UNAIDS) estimates that more than 30 million people are currently living with HIV/ AIDS (JIMSA, July September 1998), which is likely to rise to 40 million, by the year 2000 AD. Every

day 16000 new HIV infections occur (including 1600 children). Approximately 1.5 million new cases of AIDS have been reported but the estimated figure may be as high as 6 million and is likely to rise to 10 million by the year 2000AD. Five million children under 10 years of age are likely to be orphaned by the year 2000 due to HIV related deaths of their mother. It is estimated that 5.8 million people have acquired HIV infection in 1977; out of these 5,90,000 are children, of the adults, over 40% were women, and over 50% of them were 15-24 years old.

While the HIV epidemic has reached its peak and has started declining in the developed countries especially the USA, in the Sub Saharan African countries it has reached a plateau and it likely to show decline by 2000 AD; and in South Asian countries including India it will continue to show an increase in its occurrence even beyond 2000 AD, Sub Saharan Africa as a whole has reached an unprecedented level of 7.4% of all adults infected with HIV. Thailand has about 7, 50,000 persons currently infected representing 2.3% of the adult population.

Currently, over 6 million people world over are through to be co-infected with HIV and TB. Through TB not associated with HIV, is still a bigger problem with 2000 million people infected than HIV associated tuberculosis, the latter is raising faster.

The major mode of transmission of HIV world wide is unquestionably heterosexual sex; this is particularly true in developing countries, where the number of infected men and women are approximately equal. Countries such as those in Sub Saharan Africa with a predominantly heterosexual mode of

transmission have been termed by W.H.O. as pattern II countries. In contrast, pattern I countries are those in which the vast majority of cases are among men who have sex with men or among intravenous drug users. Originally, the United States and Canada, most countries in South America, Western Europe, Scandinavia, Australia, and New Zealand were clearly pattern I countries. However, in most of these countries, including the United States, the pattern is gradually shifting, with a growing proportion of new cases among heterosexuals. Pattern III countries are those in which there are relatively few cases of HIV infections/ AIDS, and most of the infected individual have had contact with individuals from pattern I or II countries. A striking index of the spread of the epidemic is the fact that, just a few years ago, India and Thailand, along with other Asian countries, countries in Eastern Europe, North Africa, and the Middle East and certain countries in the Pacific were considered pattern III countries. Both India and Thailand have rapidly evolved into pattern II countries. If educational and Behaviour- modification programs fail in other pattern III countries, there is Not known doubt that many of them will evolve to patterns I or II.

NATIONAL EPIDEMIOLOGY

South Asia especially India is witnessing largest number of new AIDS cases and the epidemic is well established in this region according to a United Nations Populations Fund (UNFPA) study "the state of world population -1977".

A total of 3,551 full blown cases of AIDS have been reported in our country till the end of May 1997 since the first

case was reported in 1986. According to NACO (National AIDS Control Programme), a total of 56,409 people have been found to be HIV positive in this country. Estimated figures for infected persons are 1.78 million with unofficial figures ranging between 3 to 5 million, projection by the year 2000 AD is of 8 million HIV infected and 1 million AIDS cases. The study of NACO reveals that the disease is no more confined to the high risk groups like sex workers, homosexuals or intravenous drug users but has spread among the general population. It has also found that 89% of the AIDS patients were in the group of 15-45. Only Arunachal Pradesh was not affected by the disease but the disease was widespread in Tamil Nadu, Manipur and Maharashtra. Accordingly it has been estimated that India is just 10 years behind an epidemic.

The first HIV seropositive individual in India was identified in 1986 among the prostitutes of Madras city. First AIDS case in India was reported in May 1986 and second case, a hemophiliac was reported a month later. Since 1985 till 31 August 1994, 803 full blown AIDS cases have been reported to the Ministry of Health & Family Welfare from 32 States / Union Territories of the country.

A survey conducted by the National AIDS Control Organization has found a prevalence rate of over 1% in five states of India – Tamil Nadu, Karnataka, Andhra Pradesh, Maharashtra and Manipur, while in the remaining states it was found to range between 0.1 and 0.5 percent. Consequently, for country as a whole, the survey has shown the prevalence rate to be less than 0.5%. The study has found the prevalence rate

to be as high as 2.4% in Maharashtra, followed by 2.3% in Karnataka, 1.58% in Andhra Pradesh and 1.4% in Tamil Nadu which is alarming to say the least.

ASSOCIATION OF TUBERCULOSIS AND HIV INTERNATIONAL STUDIES

Pitchenk et al (1984) reported, after reviewing records of tuberculosis and AIDS cases in Dade county, Florida, 27 Tubercular cases out of 45 Haitian with the syndrome but in 1 of 37 non- Haitian with the syndrome. Among 27 Haitians with the syndrome and tuberculosis, 19 had extra pulmonary tuberculosis, whereas among 286 Haitian patients with tuberculosis, only 56 had extrapulmonary tuberculosis.

Pitchenik et al (1985) reviewed X- rays recorded of 23 adults AIDS patients with culture proved tuberculosis, 17 including 8 with DT had positive serum of bronchial culture, 10 patients (59%) had hilar and mediastinal lymph nodes, localized pulmonary infection in middle or lower field in 5 patients (29%), localized pulmonary infection involving an upper lobe in 3 patients (18%), and diffuse miliary or interstitial infiltrates in 3 patients (18%). No pulmonary infiltrates in 6 patients (35%) and No abnormality in 2 patients (12%). Pulmonary cavitation was not seen. Only 1 patient had chest X- ray typical of adults' onset reactivation tuberculosis.

Mann j et al (1985) from Zairian Deptt. of Public Health detected 53(33%) seropositive case out of 159 confirmed pulmonary tuberculosis patients in Tuberculosis Sanatorium, Kinshasa, Zaire. Out of this 96 were men (60%) and 63(40%) women. The median age was 29 years (ranges 9- 67 years).

Lymphadenopathy on physical examination was equally common in HTLV – III LAV seropositive and seronegative pulmonary tuberculosis patients (35% Vs. 32%).

Sundram G et al (1986) studied 136 patients with AIDS of whom 102(75%) were intravenous drug abusers, of these 136 patients of AIDS (21.3%) were tuberculosis patients. Tuberculosis was more common among Haitian (4/8), and intravenous drug abuser (24/102) than among homosexuals who had not used drug (0/22).

Colebunders R et al (1987) found in a hospital in Zaire, 7 of 16 patients with proven tuberculosis (44%) and 18 of 33 with suspected TB (59) were found to be HIV seropositive.

Chaisson RE et al (1987) reported 35 AIDS cases, out of 287 tuberculosis cases of non - Asian Born males (15-60 years) Lung was the most frequent site of tuberculosis in both AIDS and non AIDS patient. 60% of the AIDS group had at least 1 extrapulmonary site of disease compared to 28% of non – AIDS patients. Non – significant tuberculin test were more common in AIDS patients (14 of 23 patients tested) than in non – AIDS patients (12 of 129 patients tested). Chest radiographs in AIDS patients showed predominantly, diffuse or miliary infiltrate (60%), whereas non- AIDS patients had predominantly focal infiltrates and / or caviatation 68%.

D.T. Mcleod et al (1988) studied prospectively 37 HIV seropositive patients (26 male, 11 female, mean ages 27). HIV was heterosexually transmitted and pulmonary tuberculosis was the commonest disease found in almost one third of patients (12 of 37).

Kritski et al (1988) reported 13(3.1%) HIV seropositive patients out of 423 patients (356 males and 67 Females) with active pulmonary tuberculosis.

Colebunder RL et al (1988) reported high HIV seroprevalence in sanatorium patients with early pulmonary tuberculosis (22/46 (48%) and suspected pulmonary tuberculosis patients (60/132(45%) than in patients with bacteriologically confirmed pulmonary tuberculosis (94/287 (33%). Mycobacterium isolation rates from sputum were similar in HIV seropositive (28.34 (82%) and HIV seronegative patients (135/ 159(85%).

Rieder HL et al (1989) reported 1858 cases of AIDS. Out of which 159 (8.6%) had tuberculosis. Out of 8455 cases of tuberculosis, 154 (1.8%) also had AIDS.

Modilevsky T (1989) reported tuberculosis in 39 cases out of 94 patients with HIV. Chest X- ray findings suggested mycobacterium infection in 24 (83%) of 29 patients with pulmonary tuberculosis . Sputum smear revealed AFB in 19 (83%) of 23 patients with pulmonary tuberculosis.

Van Deutekom (1989) reported tuberculosis in 18 (8%) of 225 AIDS patients. The most frequent high risk in AIDS tuberculosis patients was IV drug abuse. Chest X- ray was frequently atypical and there were more extrapulmonary lesions in comparisons to patients with tuberculosis without AIDS.

Theur et al (1990) performed HIV serology in non- Asian born patients 18-65 years old with newly diagnosed tuberculosis. Out of the 60 eligible patients, 17(28%) were found seropositive. Risk of HIV was associated with

homosexual contact, intravenous drug use, or both. Site of disease and tuberculin reactivity did not differ significantly in the two groups. Tuberculosis was the first serious opportunistic infection in all patients with HIV.

Long et al (1991) studied chest roentgenograms of 225 HIV tested adult Haitians with bacillary positive pulmonary tuberculosis. There were 67(29.8%) HIV seropositive and 158 (70.2%) HIV seronegative patients. Intrathoracic adenopathy alone was more common and parenchymal infiltrate less common. HIV seropositive patients with AIDS were significantly more likely to have a chest radiographic pattern consistent with primary tuberculosis (80%) than HIV seropositive patients without AIDS (30%).

Zajozkoska et al (1991) from Jan 1, 1989 to July 1991, 193 patients with HIV infection were treated at the Deptt. of AIDS & Infectious Disease Hospital in Warsaw and Tuberculosis was diagnosed in 110 (57%) cases.

Brudney and Dobkin (1991) studied prospectively 224 patients with tuberculosis admitted to a large public Hospital in New York, 79% were male with high rates of alcohol use 53%, I.V. drug abuse 64% and homelessness 68%. Half the patients had AIDS related complex or were HIV antibody positive.

Dupon & Ragnaud(1992) found 123 (2.1%) tuberculosis patients (121 of *M. tuberculosis* and 2 of *M bovis*) among 5730 HIV seropositive in out – patients. Tuberculosis was pulmonary in 53 patients (43.1%) extrapulmonary in 36 patients (29.3%) and combined in 24 patients (27.6%).

Pignatelli et al (1992) studied chest reentgenogram of 14 pulmonary tuberculosis patients (10.1) out of 139 patients with AIDS. Hilar lymph nodes in 4 cases (28.6%), isolated lymph nodes in 2: associated with parenchymal involvement in 2 patients, acute alveolar tuberculosis was seen in 4 cases (28.6%) with excavation in $\frac{3}{4}$ (21.4%). Linear and reticular pattern of tuberculosis were found in 4 patients (28.6%), military involvement in 1 case 9(7%) and extrapulmonary adenopathy in 4 patients (18.6%) in 4 patients (28.6%) chest X-ray finding were negative.

Allen S et al (1992) in an attempt study the incidence of tuberculosis in HIV infected and uninfected urban Rwandan women, found tuberculosis in 20 out of 460 HIV positive and in 2 of 998 HIV negative child bearing women.

Scialpi et al (1993) studied initial and follow up chest radiographs of 31 patients with the AIDS and found M. tuberculosis in 7 patients infiltrating cavitating lesion and multiple interstitial well – defined nodules less than 10 mm diameter were seen only in M. tuberculosis infection.

Sy et al (1993) studied epidemiologic features of tuberculosis patients with AIDS or HIV infection and found that have more extarpulmonary sites and more anergic reaction to tuberculin test.

Beauliev et al (1993) in a retrospective study compared clinical and bacteriological characteristics of HIV infected and seronegative patients in France. Out of 67 tubercular patients' 35 were HIV positive. Disseminated tuberculosis predominated in HIV positive as opposed to pulmonary tuberculosis in HIV

negative. Tuberculin test was more often positive HIV negative patients than in HIV positive ones (65.6% versus 17.1%). Direct bacteriological examination of the sputum was positive more frequently in HIV negative than in HIV positive patients (56.2% versus 22.8%).

Elliott et al (1993) reported 72 HIV seropositive patients put of 109 tubercular patients proved by sputum culture for M. tuberculosis. Of these 43% of the HIV positive had a negative sputum smear, compared to 24% of the HIV negative cases.

Diperri et al (1993) made a retrospective investigation to compare – occupational risk of tuberculosis in health care workers assisting HIV positive and negative patients with active tuberculosis. 7 cases occurred in those who cared for 85 HIV infected tubercular patients while 2 cases occurred in staff members who took care of 1079 HIV negative tubercular patients over the same period.

Navarro et al (1993) analyzed 215 patients dually affected by tuberculosis and HIV infection. Tuberculosis was located in the lung in 108 cases (50.23%), in 74 cases but of the lung (34.14), and in 33 cases there was intrapulmonary as well as extrapulmonary affection (15.34%).

Carcaba et al (1993) described clinical characteristics of 120 patients in the Austria region who had a tuberculosis diagnosed in any localization belonging to a series of 570 patients infected by HIV. Tuberculosis was pulmonary only in 44, in 36 it was extrapulmonary and in 52 disseminated. Most frequent risk factor was IV drug use.

Monno et al (1993) studied problems in treating 31 tuberculosis patients with HIV infection and found 5 patients (16%) had pulmonary tuberculosis, 15 (48%) had both pulmonary and extrapulmonary involvement and 11 (36%) had extrapulmonary disease alone.

Fernandez – Revuelta et al (1993) described 423 cases of pulmonary tuberculosis out of which 54 were seropositive. Of these 54 cases, 8 cases (14.8%) had miliary profile and radiology was normal in 7 cases (12.9%) in addition, they observed extrapulmonary affection in 23 cases (42.6%).

Kritski et al (1993) studied 567 patients with active pulmonary tuberculosis in Rio de Janerio, Brazil by testing blood for HIV antibodies. For chest radiographs, a significant association was found between HIV infection and the occurrence of atypical images and hilar and / or mediastinal adenopathy and absence of cavities. A PPD skin test in duration of < 5mm was identified in 53% of HIV positive and 31.3% of HIV negative cases.

Mosznki (1993) studied sero prevalence of HIV infection in tubercular patients of Kweneng District, Botswana. 45 of 214 patients (21%) were HIV positive. No significant differences were found between HIV positive and HIV negative patients with regard to clinical type of tuberculosis.

Kurutepe et al (1993) in the Chest Hospital, Hebeliada, Istambul, screened 5000 tuberculosis patients who were not at risk and 340 patients who had at least one predisposing factor for AIDS and found one seropositive patient in each group.

Monica Barbosu et al (1993) investigated 358 tuberculosis patients (308 adults, 50 children) for HIV antibodies, 64% of adults and 8% of the children were seropositive. These figures were same as of the HIV seroprevalence in he studied area.

Batungwanayo et al (1993) reported 377 tuberculosis patients

Out of which 334(8.6%0 were HIV positive and 43 (11.4%) HIV negative. Extrapulmonary tuberculosis was more in HIV positive (186/334,i.e 55.7%) than in HIV negative (17/43, 39.5%). In patients with pulmonary tuberculosis the middle and lower lobes were significantly more involved in HIV positive than in HIV negative patients (59/198, 29.8% Vs. 28,10.7%) whereas cavities were more frequently seen in HIV negative patients (15/28,53% versus 53/198, 26.7%). Anergy to PPD was significantly more frequent among HIV positive patients compared with HIV negative patients 203/274, 74% versus 11/33, 33%).

C Luo et al (1994) studied 120 children (1 month -15 year) with a clinical diagnosis of tuberculosis and 167 control for HIV antibodies. The overall HIV type I seroprevalence rate in children with tuberculosis was 55.8% (67/120) compared to 9.6 %(16/167) among control group. Common clinical presentation among children with tuberculosis were bronchopneumonia (45/162), miliary tuberculosis (30/162) and tubercular lymphadenopathy (21/33). There was no significant difference in clinical presentation of tuberculosis between the two groups.

Houston et al (1994) in a cohort study conducted in Harare, Zimbabwe tested 1434 tubercular patients for HIV infection. He found seroprevalence of 45 % (647/1434). Among adult tubercular patients (<15 years) a seroprevalence of 47 % was found (610/1303). Peak HIV seroprevalence was in 25-34 years age group. In adults, with pulmonary tuberculosis a rate of sputum smear positivity was not significantly different between the HIV seropositive and seronegative.

Abuoya et al (1995) compared chest radiographs of consecutive HIV-1, HIV-2 positive and seronegative patients with pulmonary tuberculosis. HIV -1 infected patient were significantly more likely to have extrapulmonary tuberculosis than were HIV-2 infected or HIV negative patients (20% Vs 8% and 9%). Among patients with pulmonary tuberculosis, No differences were observed in the rates of specific abnormalities on chest radiograph between HIV-1 and HIV -2 infected patients. Both HIV-1 and HIV -2 infected patients had a higher frequency of pleural effusion than did HIV negative patients (8% and 9% Vs 4%) among HIV infected patients with CD4+ count of $\geq 400/\text{mm}^3$ and $<200/\text{mm}^3$, respectively, the proportions with non- cavitary infiltrates and hilar adenopathy increase significantly (33% to 44% to 58% and 0% to 14% to 20 %), while the proportion with cavitary lesion decreased significantly (63% to 44% to 29%).

Post et al (1995) investigated the relationship between the radiographic appearance of pulmonary tuberculosis (PTB) in HIV infected patients and CD4+ T – lymphocyte count. Upper zone infiltrate typical of pulmonary tuberculosis reactivation was

present in 18 patients out of 150 patients. This was associated with early HIV infection (mean CD4+T-cell count 389) and had 78% positive predictive value for identifying patients with >200 CD4 T- lymphocytes / microl. Pleural effusion was present in 32 patients and it occurred over a wide intermediate range of CD4T cell count (mean 185). Lower or midzone infiltrates, adenopathy, interstitial pattern or normal radiograph occurred in 136 patients and were associated with advances HIV disease (mean CD4T cell count 105).

Leung et al (1996) determined the difference in the CT appearance of pulmonary tuberculosis (TB) between patients with and without HIV infection. Seropositive patients had a higher prevalence of lymphadenopathy at chest radiography, the seropositive patients had a lower prevalence of consolidation, cavitation and post primary pattern at CT, HIV seropositive patients had higher frequency of Miliary and extrapulmonary disease.

INDIAN STUDIES

Tripathi et al (1992) reported 11 cases of tuberculosis of 169 HIV-1 seropositive at Pune.

Shivarman et al (1992) screened patients, with atypical radiographic pattern harbouring multi drug resistant bacilli, and with fairly limited radiological lesion whose general condition showed unexplained deterioration, admitted to the T.B. Sanatorium, Pondicherry during the period 31.01.1990 to 30.04.1991 for AIDS out of total of 225 pulmonary tuberculosis patients thus screened for HIV antibodies, 6 were found seropositive and all were sputum positive for AFB. Out of these

6 cases, 3 had cavitation, 2 had hilar adenopathy and 2 had diffuse infiltrates.

Arora et al (1993) studied 572 consecutive patients attending clinical of the Department of T.B. and Chest Disease, Jawahar Lal Institute of Post Graduate Medical Education and Research, Pondicherry, during the period from March 1990 to December, 1992. Patients included in the study were proved cases of extrapulmonary tuberculosis, sputum positive patients and sputum smear negative patients having extensive or limited atypical disease with history of HIV risk factors and / or unexplained loss of weight and / or diarrhea. Out of these 572 patients tested for HIV -1 antibodies, 20 (15 males and 5 females) were found seropositive. 12 patients were proven and 4 were suspected cases of tuberculosis, 2 patients were diagnosed as having interstitial pneumonitis. No diagnosis could be established in remaining 2 patients. 6 of the 12 proven tubercular patients were sputum positive for AFB, 5 had bilateral infiltrative lesion with or without cavitation and had pleural effusion with pharyngeal squamous cell carcinoma leading to pharyngocutaneous fistula. History of heterosexual promiscuity in 13 out of 15 males and in none of 14 females was present. Pulmonary tuberculosis patients showed typical bilateral upper zone infiltrative extensive lesion with or without cavitation whereas suspected pulmonary tuberculosis patients showed upper zone exudative infiltrative lesions.

Anuradha et al (1993) screened patients who attended out patient Department of Thoracic Medicine, Government General Hospital Madras, included in the study were adults (18

year and above): (1) attending for first time with respiratory symptoms (2) pulmonary or extra pulmonary tuberculosis patients on ATT (3) with history of ATT and complaining of fresh symptoms. In all, 760 blood specimens were cases of tuberculosis (392 pulmonary tuberculosis, 39 extrapulmonary tuberculosis, 15 treated pulmonary tuberculosis, 10 pleural effusions).

Of the 392 pulmonary tuberculosis patients, 3 were confirmed HIV seropositive (0.77) No HIV positive cases could be detected in other sub group of tuberculosis and non tuberculosis respiratory disorder. All HIV positive patients were sputum smear positive for AFB and culture proved. All were PPD negative and chest X- ray showed bilateral lesion with cavitation in upper lobe.

Mohanty et al (1993) screened 2371 patients (1759 males and 612 females) admitted for respiratory diseases to the respiratory ward of the J.J. Hospital, Bombay between 1st November, 1988 and 31st October, 1991 for HIV infection. 85 were found positive but on repeat ELISA only 64 were positive. Of the HIV positive patients, 57 pulmonary tuberculosis (37 males/ 1759, 20 females /612) out of 1950 tuberculosis patients.

Majority of patients (HIV positive) (58/64) were in the age group between 21-50 years with maximum number in 21-30 age group (36/64). Of the total HIV positive 53 (37 males, 16 Females) had multiple heterosexual partners, 2 (2males) had multiple homosexual partners, 3 (2 males, 1 female) gave

history of use of blood and blood products, 6(2males, 4 females) were indeterminate.

31.59% of HIV seropositive pulmonary tuberculosis patients were sputum smear positive as compared to 73.12% of 1983 HIV seronegative tubercular patients (32 extra pulmonary tuberculosis patients included).

Like wise on chest X- ray, cavitation was found in 52.63% versus 54.25 % exudative in 5.26% versus 5.92% fibrotic in 31.57% versus 38.20% milliary of pleural and 7.01% versus 0.79%. Mediastinal lymphadenopathy in 3.5% versus 8.4% of the 1983 HIV seronegative tubercular patients. 94.42% were PPD positive (1 TU PPD with tween 80) while 36 (63.16%) of the HIV positive were PPD negative.

Mohanty et al (1994) reviewed the old patients (studied between 1st November, 1988 to 31st October, 1991) and the new patients (between 1st November, 1991 to October, 1993). Of the total 205 HIV positive cases 182 (5.89%) had pulmonary tuberculosis out of 3090 tubercular patients thus screened. Of these 182, 52.19% were PPD positive as compared to 93.12% of 2909 seronegative tubercular patients. Similarly for AFB positivity it was 47.08% versus 70.12% like wise on chest X- ray cavitary lesion was found in 56.04% versus 57.0% exudative in 21.98% versus 20.60%, milliary in 1.64% versus 1.0%. Pleural effusion in 5.49% versus 3.79%. mediastinal adenopathy in 2,75% versus 2.0% hydropneumothorax in 2.19% versus 5.21%.

Soloman et al (1995) studied the trend of HIV infection in patients with pulmonary tuberculosis in South India. HIV

seropositivity was found to rise significantly from 0.7% in 1991 to 1993 ($P < 0.05$).

Soloman et al (1995) studied the trend of HIV infection in patients with pulmonary tuberculosis in South India, HIV seropositivity was found to rise significantly from 0.7% in 1991 to 3.4% 1993 ($P < 0.05$).

Mohanty et al (1995) stated that seropositivity in tuberculosis patients increased from 2.56% in 1988 to 10.15% in 1994, the rate being more or less the same for the last three years. Heterosexual promiscuity was the major risk factor (95.95%) and commercial sex workers accounted for 70% of the females' tuberculosis patients with HIV infection.

HIV SEROPOSITIVITY IN HIGH RISK INDIVIDUALS

H..A. Kamat et al (1993) Studied 599 patients with various STDs IN Bombay from 1987 to 1989. 39 patients (5.2%) were found to be HIV-1 antibody seropositive by the ELISA and Western blot test. An increase in HIV-1 antibody seropositivity among both male and female patients was detected from 1987 to 1989 and seropositivity was maximally associated with Condylomata acuminata, Genital herpes and Chancroid.

R.C. Mutter et al (1994) tested 87 of the 556 prisoners continuously incarcerated since 1977 in the Florida Department of Corrections. Of these 18 inmates (21%) were found to be positive for HIV infection. 8 of these individuals had No HIV related conditions, and 10 had HIV- related symptoms. The result presents strong evidence for intraprisson transmission of HIV infection.

E.A. Simoes et al (1993) screened 412 prostitutes in remand homes in 3 cities and 3 towns in Tamil Nadu state and then tested all new entrants to one home in Vellore from 1986 to 1990. The proportion of women infected (10 of 102) from the port city of Madras was greater than from all other cities or towns combined (4 of 310). The only significant risk factor for development of HIV-1 antibody was exposure to foreigners after correcting for the influence of city.

A.N. Malviya et al (1994) studied 302 long distance truck drivers and 3 were found to be infected with HIV. In this study a large numbers of truck drivers were having sex with the prostitutes in rural areas along the highways of India. The Truck drivers could play an important role in the spread of the infection in rural India.

N. Bhushan et al (1994) studied the prevalence of HIV infection among blood donors for the five year period from April 1988 to March 1993. All donors were patients' relatives or volunteers; no paid commercial donors were accepted. Each year between 14,084 and 15,544 blood samples were screened by ELISA and those found reactive were tested by western blot. The prevalence rates were 1.5 per 1000 (1988-89), 1.1 per 1000 (1989-90 and 1990-91), 1.9 per 1000 (1991-92) and 3.1 per 1000 (1992-93). These data suggest that the prevalence of HIV in blood donors is increasing and this could be a reflection of the rising prevalence of HIV infection in the general population.

Gangakhedhkar et al (1997) assessed women attending STD clinics in Pune for STD and HIV infection from May 1993 to July 1996. Of 916 women enrolled, 525 were ESWs and 391 were non-FSWs. Prevalence of HIV in FSWs and non-FSWs was 49.9% and 13.6% respectively.

OBSERVATIONS

OBSERVATIONS

Two eighty two patients of pulmonary and extra pulmonary tuberculosis were selected from wards and OPD, Department of TB & Chest from M.L.B. Medical College Jhansi.

All the patients were subjected to ELISA test for HIV.

Table -1

HIV SERO POSITIVITY IN TOTAL CASES

Sex	No of patients	HIV Sero Positive	HIV Sero Negative
Male	184 (100%)	16(8.69%)	168(91.31%)
Female	98(100%)	2 (2.04%)	96(97.6%)
Total	282 (100%)	18(6.38%)	264(93.62%)

Out of 282 patients of pulmonary and extra pulmonary tuberculosis 184 (65.2%) were males and 98(34.75%) were females. Youngest patient was 7 years old and oldest 72 years old, most cases were in age group of 21-30 years followed by 31- 40 years of age group.

Presentation of the Patients According to age group and sex

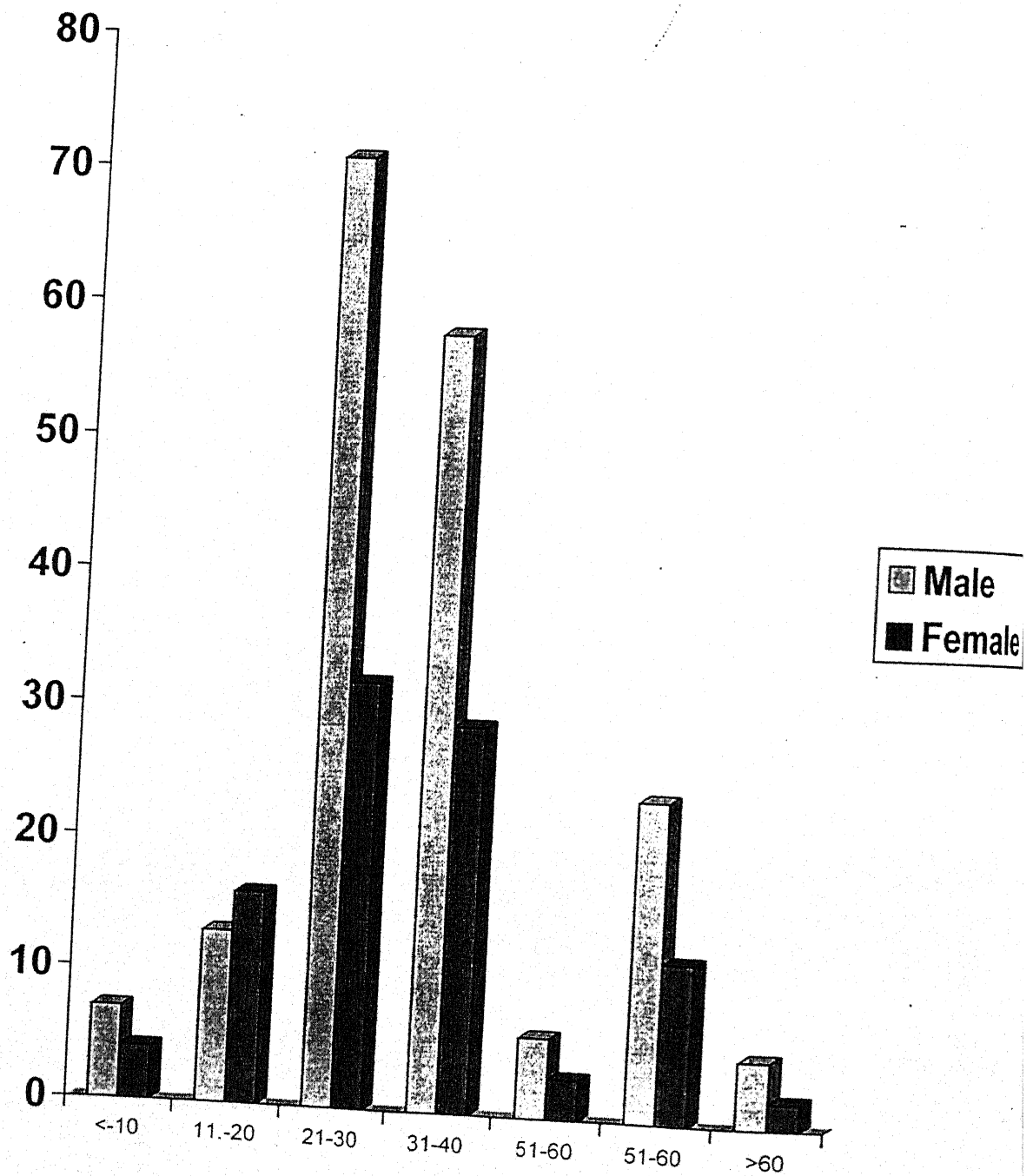


Table -2
PRESENTATION OF THE PATIENTS
ACCORDING TO AGE GROUP AND SEX

Age Group (Years)	Male	Female	Total
<-10	07	04	11(3.9%)
11-20	13	16	29 (10.3%)
21-30	71	32	103(36.5%)
31-40	58	29	87(30.9%)
41-50	24	12	36(12.8%)
51-60	06	03	9(3.2%)
>60	05	02	7(2.4%)
Total	184(65.2%)	98(34.8%)	282(100%)

Out of 282 cases, 184 (65.2%) were males & 98(34.8%) were female.

HIV Seroprevalance According to age group

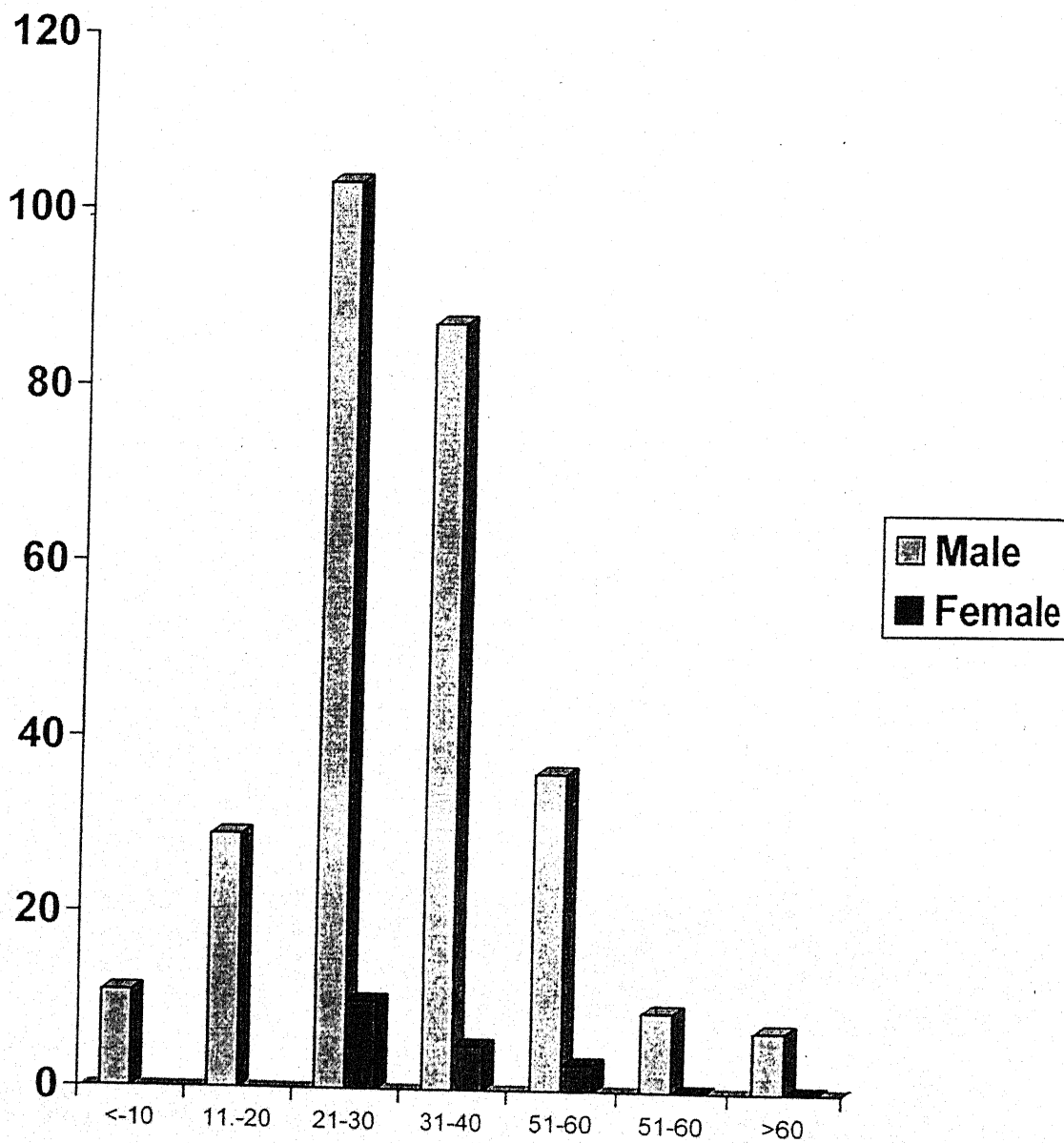


Table -3**HIV SEROPREVALANCE ACCORDING TO AGE GROUP**

Age Group (Years)	Total No. of Cases	Sero positive cases	Sero negative cases
<-10	11	Nil	11(100%)
11-20	29	Nil	29(100%)
21-30	103	10(9.70%)	93(90.29%)
31-40	87	5(5.74%)	83(95.40%)
41-50	36	3(8.33%)	33(91.66%)
51-60	09	Nil	09(100%)
>60	07	Nil	07(100%)
Total	282 (100%)	18(6.32%)	264(93.62%)

Out of 282 cases, HIV seropositive were 16(8.32%), 10 cases (9.70%) were in age group of 21-30 years, 5(5.74%) were in age group of 31-40, 3(8.33%) were of 41-50 years.

Table - 4
HIV SERO POSITIVITY AS PER RURAL/URBAN
BACKGROUND

Sex	No of patients	HIV Sero Positive	HIV Sero Negative
Rural	131(100%)	8 (6.10%)	123 (93.89%)
Urban	151(100%)	10(6.62%)	141(93.37%)
Total	282(100%)	18(6.38%)	264(93.62%)

Out of 282 patients, 131 (46.4%) were from rural areas and 151 (53.5%) were from urban areas. Out of 18 HIV seropositive patients, 10(6.62%) were of urban areas while 8(6.10%) had rural background.

Table – 5
DISTRIBUTION OF HIV SEROPOSITIVITY
ACCORDING TO RELIGION

Sex	No of patients	HIV Sero Positive	HIV Sero Negative
Hindu	149 (100%)	15(10.06%)	134 (89.93%)
Muslim	122(100%)	03(2.45%)	119(97.54%)
Other	11 (100%)	Nil	11(100%)
Total	282 (100%)	18(6.38%)	264(93.62%)

Out of 282 patients of pulmonary & extra pulmonary tuberculosis. Hindus were 149 (52.8%) and Muslims were 122 (43.2%). Out of these seropositive cases, 15 (10.06%) were Hindus and 3(2.45%) were Muslims.

11 cases were from other communities and no one was seropositive.

Table - 6
HIV SERO POSITIVITY ACCORDING TO
OCCUPATION

Occupation	No of patients	HIV Sero Positive	HIV Sero Negative
Truck Driver (Long Route)	11(100%)	06(54.54 %)	05 (45.45 %)
Salesman	24 (100%)	07(29.16%)	17 (70.84%)
House wife	90(100%)	02(2.22%)	88 (97.78 %)
Others (Rickshaw Puller and Labourer)	157(100%)	03(1.91 %)	157 (98.08 %)
Total	282(100%)	18(6.38%)	264 (93.62%)

From 282 patients, 11 (3.91%) were truck drivers, majority of them were long route drivers and 6 (54.5%) were HIV seropositive. Out of 24 (8.5%) salesman, 7(29.16%) were HIV seropositive. Out of 90 (3.19%) housewives only 2 (2.22%) were reported as HIV positive. One of these two females had HIV seropositive husband. Status of husband of other female (HIV seropositive) was not known.

Others from Rickshaw puller, labourers etc. 157 (55.67%), 3 (1.91%) were HIV seropositive.

Table - 7
HIV SERO POSITIVITY AMONG FRESH / TREATED
CASES

	No of patients	HIV Sero Positive	HIV Sero Negative
Fresh	135 (100%)	6 (4.44%)	129 (95.55%)
Treated	147 (100%)	11(7.48%	136 (92.52%)
Total	282 (100%)	17	264 (93.62%)

- 1 HIV seropositive patient was asymptomatic.

Out of 282 patients of pulmonary and extra pulmonary tuberculosis 135 (47.87%) were fresh cases, while 147 (82.12%) had received ATT for more than 2 weeks.

Table - 8

HIV SERO POSITIVITY ACCORDING TO RECOGNIZED RISK FACTORS

Risk factors	No of patients	HIV Sero Positive	HIV Sero Negative
Hetero Sexual Promiscuity	35 (100%)	15 (42.85%)	20 (57.15%)
Homo Sexual + Hetero sexual	01 (100%)	01(100%)	00
I/V Drug Abusers	06 (100%)	Nil	06
Blood Transfusion	11(100%)	Nil	11
Wives of HIV positive	05(100%)	01 (20%)	04 (80%)
No known Risk factors or concealed	224 (100%)	01 (0.47%)	223 (99.53%)
Total	282(100%	18 (6.38%)	264(93.62%)

Out of 282 patients of pulmonary and extra pulmonary tuberculosis 35 (12.4%) had Hetero sexual promiscuity. Out of these 15 (42.35%) were HIV seropositive.

One patient was both homo and hetero sexual 6(2.12%) out of 282 were I.V drug abusers. 11 (3.90%) out of 282 had blood transfusion in the past, but none reported HIV positive.

1 (20 %) out of 5 housewives of HIV seropositive husbands , was HIV seropositive.

In 224 cases with no known risk factor only 1(0.47) was HIV seropositive.

16/ 18 (88.88%) patients had hetero sexual promiscuity.

Table - 9
HIV SERO POSITIVITY ACCORDING TO PLACE OF
CONTACT

	No of patients	HIV Sero Positive	HIV Sero Negative
Bombay	48 (100%)	14 (29.16%)	34 (70.8%)
Delhi/ North East	56 (100%)	02 (3.58%)	54 (96.42%)
Other	178 (100%)	02 (1.12%)	176 (98.9%)
Total	282 (100%)	18 (6.38%)	264 (93.62%)

Out of 282 cases 48 (17.02%) had Heterosexual contact in Bombay. Of These 14 (29.16%) were HIV seropositive. 56 (19.85%) had contact in Delhi / North East / rest of the country. Out of these only 2 (3.58%) were HIV seropositive. Rest 178 (63.12%) had contact in Jhansi but all were HIV seronegative.

Table - 10
Distribution of Tubercular Patients according to
seropositive and bacteriological status.

	No of patients	HIV Sero Positive	HIV Sero Negative
Sputum Positive	115 (100%)	08 (6.96%)	107 (93.04%)
Serum Negative	167 (100%)	10 (5.99%)	157(94.01%)
Total	282 (100%)	18(6.38%)	264(93.62%)

Out of 282 patients of pulmonary and extra pulmonary tuberculosis 115 (40.78%) were sputum smear positive for AFB while 167 (59.2%) were sputum smear negative for AFB.

Out of 115 sputum smear positive for AFB patients, 8(6.96%) were HIV seropositive , while 107 (93.04%) were HIV seronegative.

Similarly out of 167 smear negative, 10 (5.99%) were HIV seropositive and 157 (94.01%) were HIV seronegative. Sputum smear positivity was 8/18 (44.44%) in HIV seropositive.

Table - 11
DISTRIBUTION OF PATIENTS ACCORDING TO
TUBERCULIN TEST

	No of patients	HIV Sero Positive	HIV Sero Negative
Mantoux positive	207 (100%)	02 (0.97%)	205 (99.03%)
Mantoux Negative	75(100%)	16 (21.33%)	59 (78.66%)
Total	282 (100%)	18 (6.38%)	264 (93.62%)

Out Of 282 patients 207 (73.40%) were Mantoux positive while rest 75(26.59%) were mantoux negative.

Out of 207 (73.40 %) Mantoux positive 2(0.97%) were HIV seropositive . While out of 75 (26.59%) Mantoux negative cases, 16 (21.33%) were HIV seropositive.

2/18 (11.11%) HIV seropositive were Mantoux positive in contrast to 16/18 (88.88%) Mantoux negative in HIV seropositive.

TABLE - 12
DISTRIBUTION OF HIV SERO POSITIVITY CASES
ACCORDING TO ORGAN INVOLVED

Types of Tub.	No of patients	HIV Sero Positive	HIV Sero Negative
Extra Pulmonary Tub. Only	86(100%)	2(2.3%)	84(97.67%)
Pulmonary Tub. Only	104(100%)	6(5.77%)	98(94.23%)
Both Pulm. & Extra Pulm. Tub.	92(100%)	9(9.78%)	83(90.21%)
Asymptomatic		1(0.35%)	
Total	282	18(6.38%)	264(93.62)

Out of 282 cases 86(30.49%) were extra pulmonary only.
 Of these 2 (2.33%) were HIV seropositive.

104 (36.87%) were of pulmonary tuberculosis. Of these 6(5.77%) were HIV seropositive. From 92(32.62%) cases of both extra pulmonary and pulmonary tuberculosis, 9(9.78%) were HIV seropositive.

2/18 (11.11%) of HIV seropositive had extra pulmonary tuberculosis, 6/18 (33.33%) of HIV seropositive had pulmonary tuberculosis only, and 9/18 (50%) of HIV seropositive had been pulmonary tuberculosis and extra pulmonary tuberculosis combined.

Table 13

**DISTRIBUTION OF HIV SEROPOSITIVE CASES
ACCORDING TO EXTRA PULMONARY ORGAN
INVOLVEMENT**

Site of Involvement	No. of Patients	HIV Sero Positive	HIV Sero Negative
Lymphatic	97	11(11.22%)	86(88.77%)
Pleural	32	1(3.12%)	31(96.87%)
Bone Joint	20	Nil	20(100%)
Abdominal	9	Nil	9(100%)
TBM	18	Nil	18(100%)

Out of 178 (62.76%) of extra pulmonary tuberculosis. 97 (54.49%) had lymphatic involvement. Out of these 11(11.22%) were HIV seropositive. From 32(18.01%) of pleural involvement, 1(3.12%) was seropositive.

From Bone Joint 20(11.29%), Abdominal 9 (5.08%), TBM 19(6.73%), none reported seropositive for HIV.

TABLE 14
DISTRIBUTION OF PULMONARY TUBERCULOSIS
ACCORDING TO RADIOLOGICAL PRESENTATION

Acc. To Zone Involved	No. of Patients	HIV Sero Positive	HIV Sero Negative
Upper Zone	100	4 (4%)	96(96%)
Middle Zone	60	5(8.33%)	55(91.67%)
Lower Zone	36	6(16.66%)	30(83.34%)
Total	196	15	181(92.35%)
According to Type of Lesion			
Cavitary	46	3(1.3%)	43(98.7%)
Exudative	58	5(8.62%)	53(91.38%)
Fibrotic	42	2(4.76%)	40(95.24%)
Miliary	16	3(18.75%)	13(81.25%)
Pleural Effusion	26	1(3.84%)	25(96.16%)
Hydropneumothorax	8	1(12.5%)	7(87.5%)
Total	196	15	181

Out of 100(51.02%) upper zone lesion, 4(4%) were HIV seropositive. Out of 60(30.16%) of Middle zone lesion, 5(8.33%) were seropositive.

Out of 36(18.36%) lower zone involvement, 6(16.66%) were seropositive. 4/15 (26.66%), 5/15 (33.33%), 6/15(40%) of HIV seropositive patients had upper zone, middle zone and lower zone lesion respectively.

Out of 46(23.46%) cavitary cases, 3(1.3%) were HIV seropositive. Out of 58(29.69%) exudative, 5(8.62%) were HIV seropositive. Out of 42(21.42%) fibrotic, 2(4.76%) were HIV

seropositive. Miliary 16(8.16%), 3(18.75%), were HIV seropositive. Pleural effusion 26(13.26%), 1(3.84%) was HIV seropositive. Out of 8 cases of Hydropneumothorax 1(12.5%) was HIV seropositive.

HIV seropositive with cavitary lesions were 3/15 (20%), with exudative lesions 5/15 (33.33%), with fibrotic lesion 2/15 (13.33%), Pleural Effusion 1/15(6.66%), Hydroneumothorax 1/15 (6.66%), Miliary tubercular were 3/15 (20%).

TABLE-15
DISTRIBUTION OF CLINICAL FEATURES IN HIV
SEROPOSITIVE PATIENTS

Clinical Features	No. of Patients	HIV Sero Positive	HIV Sero Negative
Fever	269(100%)	17(6.31%)	252(93.68%)
Cough	196(100%)	15(7.65%)	181(92.34%)
Hemoptysis	26(100%)	2(7.69%)	24(92.30%)
Weight Loss	201(100%)	17(8.45%)	184(91.54%)
Headache/ Altered Sensorium/ Neck Stiffness/ Seizure	19(100%)	Nil	19(100%)
Low back ache/ Joint Involvement	20(100)	Nil	20(100)
Abdominal Cramps/ Distension	9(100%)	Nil	9(100%)
Chronic Diarrhoea	33(100%)	13(39.39%)	20(60.60%)
Herpes	4(100%)	Nil	4(100%)
Oral Thrush	37(100%)	8(21.62%)	29(78.37%)

Out of 282 patients of pulmonary and extra pulmonary tuberculosis 269(95.39%) had fever. Of these 17 (6.31%) were HIV seropositive.

Similarly weight loss was seen in 201(71.27%), 17(6.31%) patients were HIV seropositive.

Chronic Diarrhoea was present in 33 patients (11.70%) and 13(39.39%) of these were HIV seropositive.

Fever and weight loss were the most common features 17/18 (94.44%) in HIV seropositive patients followed by chronic diarrhea 13/18(72.22%) and oral thrush 8/18(44.44%).

Table 16
Type of HIV Virus in HIV seropositive Patients

Case	Elisa	
	HIV 1	HIV 1+ HIV2
Case 1	+	-
Case 2	+	-
Case 3	+	-
Case 4	-	+
Case 5	-	+
Case 6	-	+
Case 7	+	-
Case 8	+	-
Case 9	-	+
Case 10	+	-
Case 11	-	+
Case 12	-	+
Case 13	-	+
Case 14	+	-
Case 15	+	-
Case 16	+	-
Case 17	-	+
Case 18	+	-
Total	10	8

10/18 (55%) cases of HIV seropositive had antibodies against HIV 1 and 8/18 (38%) cases had antibodies against HIV 1 and HIV 2 Both.

DISCUSSION

DISCUSSIONS

Two hundred eighty two patients aged 7 years and above attending OPD & ward of Medicine, TB & Chest, of M.L.B. Medical College Jhansi were admitted for treatment of tuberculosis and selected according to the criteria mentioned previously. All the selected patients were screened for HIV.

The prevalence of HIV seropositive among pulmonary & extra pulmonary tuberculosis in the present study was 6.38%, which is higher or equal to reported in other Indian studies.

In two studies **Mohanty** et al (1995) reported seroprevalence of 10.15% from Mumbai. In two studies from **Pondicherry, Sivarama** (1992) & **Arora** (1993) reported HIV 2.7% & 3.4% seroprevalence respectively.

The high prevalence of HIV infection in tuberculosis in Mumbai & Pondicherry is because of high prevalence of HIV infection in these cities. Mumbai being an industrial city with port has large population of CSW (Commercial Sex Workers) which cater to the immigrant population from other parts of the country. Thus, this segment falls easy prey to these CSW. Infact in Mumbai, CSW's have very high seroprevalence of HIV infection, even as high as 51% (**Lal et al 1994**) similarly, sexual promiscuity is more in these metropolis than in other part of the country. Foreign tourists in these parts particularly Pondicherry which has some French colonies form an added burden of HIV infection. HIV seroprevalence in western countries is very high as compared to our country.

The increase of seroprevalence in our study is for two reasons. Firstly, in place of random screening, only those

patients were screened for HIV infection where there was a strong suspicion, based of history, Clinical features & Radiological presentation, Secondly, any extra pulmonary or pulmonary tuberculosis case that had visited Mumbai and had sexual contact there, was screened. Thus, the obvious increase in HIV seroprevalence positive was seen in this study.

The higher seroprevalence of HIV in this study highlight the impact of migratory or mobile population and the changing mores of the society. As majority of HIV cases are truck drivers (54.54%) and Salesman (29.16%), they had contact chiefly from Mumbai.

The relatively low prevalence (1.12%) among contacts from Jhansi, suggest the import of disease from other parts of the country.

HIV seroprevalence in tubercular patients was higher in Africans & Western studies than in Indian studies, including present one. **Elliot et al (1992)** reported seroprevalence of 66% amongst sputum positive tubercular patient in Zambia. In **Ruanda, Batungwnayo (1994)** found HIV seroprevalence in tubercular patients to be 88.6%. Such high level of HIV seropositivity in tubercular patients in Africa has been attributed to high prevalence of each infection in general population there. In India on the other hand the seroprevalence of HIV infection in general population is 1-2% (**Laal et al (1994)**) and of tubercular infection high 40% (**Narain (1993)**). The prevalence of dual infection is low.

Theur et al (1990) reported 28% HIV seroprevalence in tubercular patients from San Franscisco. Higher positivity in

USA was due to higher prevalence of HIV infection in the general population, in whom the prevalence of tubercular infection was low. The HIV induced immuno suppression then led to the infection with *Mycobacterium tuberculosis* and disease.

The HIV seroprevalence among tubercular patients in Indian studies carried out in various states was found to be twice as compared to the seroprevalence in the population screened in those states.

This implies that tubercular patients have high seroprevalence of HIV infection. HIV seroprevalence in patients of tuberculosis was high in states where there was a high seroprevalence in screen population. For example in Maharashtra it was 2.84% in screen patients and 5.89% in tubercular patients. In Pondicherry it was 1.50% & 3.4% respectively. It implies that with increasing HIV seroprevalence, increased number of tubercular patients with HIV seropositivity is expected.

SOCIODEMOGRAPHIC DISTRIBUTION OF CASES ACCORDING TO SEROLOGIC STATUS SEX

In the present study the seroprevalence of HIV infection in male patient was 16/184 (8.69%) while 16/18 (88.88%) of HIV seropositive were males. In females HIV seroprevalence was 2/98 (2.04%) while 2/18 (11.11%) HIV positive were females.

Anuradha et al 1993 reported 66.6% male HIV seropositive with pulmonary tuberculosis cases. **Mohanty et al in 1993** reported 56.25% males and 21.88% females.

AGE

Out of 18 HIV seropositive 10(55.55%) were in age group of 21-30 years, 5 (27.77%) in age group of 31-40 years and 3 (16.66%) in the age group of 41-50 years. Thus highest prevalence was seen in age group of 21-40 years (83.33%) in Mumbai, **Mohanty et al (1994)** found highest HIV prevalence (71.7%) in 21-40 years age group in tubercular patients. **SH Talib et al 1993** reported maximum HIV cases in age group 20-39.

In **San Fransisco Theur et al (1990)** found the HIV seropositive patients were significantly more in 18-40 years age group.

RELIGION

HIV seroprevalence in Muslims & Hindus patients of pulmonary and extra pulmonary tuberculosis was 2.45% & 10.06% respectively.

RESIDENCE

HIV seropositive patients of pulmonary and extra pulmonary tuberculosis were from urban 8 (6.10%) & 10 (6.62%) were from rural areas. This data s different from **Rizdan et al** who reported 9.6% residents from large town , 4% from small town dwellers & 2% on rural areas. The difference could be because less numbers of cases were screened.

RISK FACTORS

6(54.54%) of truck drivers (majority of long route) were HIV seropositive and 7 (29.16%) were salesman. All had visited Mumbai at some point of time. This data correlates well with figures of HIV seropositive CSW's in Mumbai **Mohanty et al 1994** and **Lal et al 1994**.

Heterosexual promiscuity was the main risk factor in the present study. This study was found in 15/18 (83.33%) of HIV seropositive patients with pulmonary and extra pulmonary tuberculosis. **Mohanty et al in 1995** reported heterosexual promiscuity in 95.95% of HIV seropositive cases. **Arora et al in 1991** reported heterosexual promiscuity in 75% of HIV seropositive. Out of two females who were positive in this study, one was wife of HIV positive husband. The HIV status of husband of other female should not be ascertained.

One HIV seropositive was both homosexual and heterosexual promiscuous. No I/V drug abuser or blood transfusion recipient reported positive. This agrees with the fact that in India, heterosexual promiscuity is the major risk factor. Homosexually and I/V drug being limited to small groups, such as inmates of jails,, armed forces and to certain areas like North East States of India. **Mohanty et al (1994)** reported use of blood products in 2.92% of HIV positive tubercular cases.

In this study, most of the HIV seropositive 14/18 (77.77%), had contact in Mumbai. This observation goes well with study of **Mehendale et al** in collaboration with John Hopkins University which shows high seroprevalence in a high risk sentinel group of CWS in Mumbai.

The present study reveals rising trend in HIV infection among pulmonary and extra pulmonary tuberculosis patients and therefore as recommended by CDC (Centre for Disease Control)- persons with tuberculosis should be questioned about risk factor of HIV infection and subsequently screened for the same.

SPUTUM SMEAR FOR ACID FAST BACILLI

Due to various immunopathogenic mechanism working at various levels, it is believed that the sputum smear examination is less rewarding in patients of AIDS, **Barnes et al 1991** showed that, Acid fast smear of sputum were positive in 31% to 82% in pulmonary tuberculosis and HIV infection. In the present study sputum was positive in 44.4% of HIV patient and sputum negative in 55.55% of HIV seropositive patients. This study is similar to **Klen et al , 1993** which showed that 45% of AIDS patient with pulmonary tuberculosis were sputum positive in contrast to 81% of control group.

Our findings are different from **Anuradha et al 1993**, who found sputum positivity in 100% cases. This difference could be because of involvement of extra pulmonary cases in our study.

Beuliev et al (1993) reported sputum smear positivity in 22.8% of HIV positive tubercular patients as compared to 56.2% HIV negative patients. **Eliot et al (1993)** reported 51% and 76% sputum positivity in HIV seropositive and HIV sero negative respectively. Similar results were obtained by **Mohanty et al 1993**, who found smear positive sputum in only 31.59% in HIV seropositive with tuberculosis.

MANTOUX TEST

16/18 (88.81%) of pulmonary and extra pulmonary tuberculosis patients with HIV positive serology were Mantoux negative, in contrast to 2/18 (11.11%) Mantoux positivity in HIV seropositive patients. This study is not very different from findings reported by **Anuradha et al 1993**, who reported 0% tuberculin test positive in HIV seropositive tubercular patients. **Mohanty et al 1995** found 52.3% of HIV positive tubercular patients to be tuberculin positive as compared to 92.02% in HIV negative tuberculosis patients.

None of the HIV seropositive had MDR tuberculosis. Out of 135 fresh cases 6 (4.49%) were HIV positive and 11(7.48%) HIV positive were from treated group.

2/18 (11.1%) of HIV seropositive patients had extra pulmonary tuberculosis. **Batung Wanaya et al 1993** showed extra pulmonary tuberculosis in 55.7% cases. **Houstan et al** from extra pulmonary tuberculosis in 10.2% HIV Positive and 4.8% pulmonary tuberculosis patients. 9/18 (50%) of HIV seropositive patients had both pulmonary and extra pulmonary tuberculosis. This finding is similar to earlier reported by **Arora et al ((1993)** (60%). **Anuradha et al** showed 100% pulmonary tuberculosis.

Indian studies show very low seropositivity in extra pulmonary tuberculosis, **Anuradha et al 1993** showed 0% HIV seropositivity with extra pulmonary tuberculosis.

Higher prevalence of extra pulmonary tuberculosis in this study could be because of specific inclusion of extra pulmonary tuberculosis cases in this study. However combination of extra

pulmonary tuberculosis and pulmonary tuberculosis is the most common presentation 9/18(50%) in this study.

Commonest extra pulmonary tuberculosis in HIV seropositive patients was lymph node tuberculosis (11.22%) however , 11/13 (84.65%) HIV positive with extra pulmonary tuberculosis had lymphatic tuberculosis.

The difference in frequency of pulmonary and extra pulmonary tuberculosis in HIV seropositive patients in India and the west may be because of lesser degree of immunosuppression in India HIV infected.

Hass 1994 believed that extra pulmonary tuberculosis is because of less effective immunity and it is more common in immunosuppressed HIV patients in the west.

It is possible that Indian patients, more frequently exposed to mycobacterium tuberculosis than their western counterparts, develop pulmonary tuberculosis first & later acquire HIV infection.

In the west on the other hand, patients may have acquired HIV infection first & subsequent to immunosuppression may have developed tuberculosis.

RADIOLOGICAL

4/15(26.66%), 5/15 (33.33%), 6/15(40%), had upper, middle and lower zone involvements respectively. HIV seropositive with cavitary lesions 3/15(20%), exudative lesions 5/15(33.33%), with fibrotic lesions 2/15 (13.33%), military tuberculosis 3/15(20%), pleural effusion 1/5 (6.66%), hydropneumothorax 1/15(6.66%) were reported in this study.

These results are similar to various studies conducted in India and abroad. **Mohantly et al 1994, Arora et al 1993, Shivaraman et al 1986, Pignatelle 1992** etc. reported almost similar results.

CLINICAL FEATURES

Fever and weight loss were most common features 17/16 (99.44%) followed by chronic diarrhea 13/11 (72.22%) and oral thrush 8/18(44.44%).

In this study 10/18(55%) of HIV seropositive for HIV 1 and 8/18(38%) were HIV 1 & HIV 2 both. This study is similar to the study of **R Kulshrestha et al** which reported HIV-2 prevalence of 31.25% in U.P.

HIV infection and AIDS in our set up is more than a medical problem. The demographic, economic and social impact is far reaching with substantial effects on the individual and family structure.

Industry, agriculture and whole economic are destabilished by the illness and deaths from AIDS of young, highly productive adults at the peak of there output.

AIDS challenges the very basis of family ties and rips open societal attitudes towards issues like sexuality, gender in equality and development.

Above all AIDS is an individual's battle – with his broken self and with relentless virus. A battle he has to fight to the bitter end, a battle he is destined to lose. This long drawn affair provides enough time to brood over the lone night' callousness, curse the needle or blame the blood bank.

It is too late to quibble over numbers, for HIV/ AIDS pandemic is varying much here. Now we as a nation to choose between playing the ostrich or face the challenge with creative solutions.

CONCLUSION

CONCLUSIONS

The study comprised of two eighty two patient of pulmonary and extra pulmonary tuberculosis with radiographic features frequently co- existing with HIV.

The conclusions are as follows:

1. 18(6.38%) out of 282 patients of pulmonary and extra pulmonary tuberculosis were HIV seropositive.
2. Out of 18 HIV seropositive 16(88.8%) were male and 2(11.1%) females.
3. Most cases of 10(55.5% were from 21-30 years, followed by 5(27.7%) 31-40 years, and 3(16.6%) in 41-50 years.
4. 8(44.4%) HIV seropositive were from rural area and 10(55.5%) were from urban area 3(16.6%) were Muslims and 15(83.3%) were Hindus.
5. 6 out of 18 (33%) were truck drivers, 7/18 (38%) were salesman, 2/18 (11.1%) were housewives. One of these, was the wife of a HIV positive male.
6. 14/18 (77.77%) had sexual contact in Mumbai compared to 2/18 (11.11%) from Delhi/ North East, 2(1.12%) had contact in Jhansi.
7. 16 out of 18(88.8%) had heterosexual promiscuity, 1(20%) was wife of HIV positive 1(.47%) had no known risk factors or concealed.
8. 8/18 (44.44%) and 10/18 (55.55%) were sputum positive and negative for AFB respectively.
9. 2/18 (11.11%) of HIV seropositive were Mantoux positive in contrast to 16/18 (88.88%) Mantuox negative.

10. 2/18 (11.11%) of HIV seropositive patients had extra pulmonary tuberculosis, 6/18 (33.33%) pulmonary tuberculosis only. 9/18 (50%) of HIV seropositive patients had both pulmonary and extra pulmonary tuberculosis.
11. Lymphatic involvement 11.(11.22%) was the most common involvement in extra pulmonary tuberculosis followed by pleural 1(3.12%).
12. 4/15 (26.66%), 5/15(33.33%), 6/15(40%) of HIV seropositive patients had upper, middle and lower zone involvement respectively.
13. HIV seropositive with cavitary lesion were 3/15 (20%), exudative 5/15 (33.33%), Fibrotic 2/15 (13.33%) pleural effusion 1/15 (6.66%), Hydropneumothorex 1/15 (6.66%) milliary 3/15 (20%).
14. Fever and weight loss was the most common features, 17/18 (94.44%) followed by Chronic Diarrhea 13/18 (72.22%) and oral thrush 8/18 (44.44%) in HIV seropositive patients. No patients of Herpes reported for HIV.
15. Out of the 18 HIV seropositive tubercular patients, 10 (55.5%) had antibodies against HIV1 and 8 (44.4%) had antibodies against HIV1 & HIV 2.

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MASTER CHART

MASTER CHART

Case NO	Age (Yrs) Sex	Marital Status Residence/ Religion	Occupation	Risk factor	Clinical Presentation
1.	32M	Married, Urban, Hindu	Truck driver	Heterosexual promiscuity	Pulmonary tuberculosis
2.	30M	Unmarried, Urban, Hindu	Truck driver	Heterosexual Promiscuity	Pulmonary tuberculosis
3.	25 M	Married, Rural, Muslim	Truck driver	Heterosexual Promiscuity	Pulmonary tuberculosis
4.	25 M	Married, Rural, Muslim	Truck driver	Heterosexual	Pulmonary tuberculosis
5.	32M	Married, Urban, Hindu	Truck driver	Heterosexual Promiscuity	Pulmonary tuberculosis+ Tuberculosis Lymphadenitis
6.	24M	Unmarried , rural, Hindu	Truck driver	Heterosexual promiscuity	Tuberculosis Lymphadenitis
7.	33/M	Married, Rural, Hindu	Salesman	Heterosexual	Pulmonary tuberculosis
8.	25/M	Unmarried, Urban, Hindu	Salesman	Heterosexual Promiscuity	Pulmonary tuberculosis
9.	30/M	Married, Urban, Hindu	Salesman	Heterosexual	Pulmonary tuberculosis
10.	32/M	Married, Rural, Hindu	Salesman	Heterosexual	Pulmonary tuberculosis

11.	35/M	Married, Urban, Hindu	Salesman	Heterosexual	Pulmonary tuberculosis
12.	28/M	Married, Urban, Muslim	Salesman	Heterosexual Promiscuity	Pulmonary tuberculosis
13.	20/M	Unmarried, Rural, Hindu	Salesman With student	Heterosexual	Pulmonary tuberculosis
14.	35/M	Married, Urban, Muslim	Labourer	Heterosexual Promiscuity	Pulmonary tuberculosis
15.	26/m	Married Rural, Hindu	Ricshaw Pullar	Heterosexual	Pulmonary tuberculosis
16.	30/F	Married, Urban Hindu	Housewife	Wife of HIV +ve Male	Asymptomatic
17.	28/F	Married, Rural, Hindu	Housewife	Husband HIV status not known	Pulmonary Tuberculosis
18.	35/M	Married, Urban, Hindu	Truck driver	Heterosexual	Pulmonary tuberculosis

*WORKING
PERFORMA*

WORKING PROFORMA

HIV SEROPOSITIVITY IN PATIENTS OF PULMONARY TUBERCULOSIS AND EXTRA PULMONARY TUBERCULOSIS WITH RADIOGRAPHIC FEATURES FREQUENTLY CO - EXISTING WITH HIV

MRD NO

Date

Name

Age / Sex

Male / Female

Religion Hindu / Muslim / Sikh / Christian

Address

Occupation

Previous Place visited Bombay/ Chennai / North East

Clinical I/C

OPD/ Indoor/Rural Health Scheme

Symptomatology:

Cough

Present \ Absent (Duration)

Expectoration

Present \ Absent (Duration) . Scanty / Moderate /

Copious / Copious / Mucoïd / Muco- purulent / Others .

Foul smelling/ Non foul smelling

Fever

Present \ Absent (Duration) Low / Moderate / High .

Chills/Rigor/Nil . Continues / Remittent/ Intermittent/

circadian Predilection Morning / Noon/ Evening / Night

Hemoptysis

Present \ Absent (Duration) streaking / Minimal/

Moderate / Massive

Breathlessness

Present \ Absent (Duration) At rest/ On extention

Chest Pain

Present \ Absent (Duration) Type / Radiation/ associated
with Respiration

Headache

Present \ Absent (Duration) Type/ Time

Photophobia

Present \ Absent (Duration)

Neck Stiffness

Present \ Absent (Duration)

Altered Sensorium

Present \ Absent

Convulsions

Tonic /Clonic / Generalised

Hemiparesis/ Monoparesis

Present \ Absent

Signs of raised ICT

Present \ Absent

Abdominal Pain

Present \ Absent . Type / Duration / Time / Relation to
meals

Weight Loss

Present \ Absent

Abdominal distension / Guarding / Rigidity /

Present \ Absent

Doughy feeling

Nausea / Vomiting/ Constipation

Present \ Absent

Diarrhoea	Present \ Absent / Acute / associated with Tenosynovitis / Abdominal Cramps / bloody stool
Low Back Pain	Present \ Absent (Duration) associated with morning stiffness / Abscess formation / Attitude spinal Abnormalities if any
Lymph Nodes	Group Involved / Cervical / Inguinal / Mediastinal / Axillary Matted Non Matted / Painful / Painless / Abscess Present / Absent / Chronic discharging Sinus
Genito - Urinary	Dysuria / Haematuria / Loin Pain Present / absent
Oropharyngeal Candidiasis / Angular Cheilitis	Present \ Absent
Herpes	Present \ Absent
Personal History	
Smoking	Smoking / Non Smoking / Passive Smoker . Bed / Cigarette / Cigar / Hukka / Pipe Number Smoked / day / Years
Alcohol	Occasional intake / Alcoholic / nil
Drug Addiction on syringe	Opium / Mandrax / Barbiturate / Indian Hemp I/V drug if I/V drug abuse . Whether involved or not
Sexual Contact	If yes single / Multiple . Whether other partner had H/O
Yes / No	multiple sexual contact . H/O other Unnatural Act (Specify) . H/O commercial sex worker.
Past - History	
Recurrent infection	Yes / No if yes state details
H/O Diabetes Mellitus	Yes / No
Blood transfusion / Visiting Dentist / Previous Surgery	Yes / No
H/O taking injection probably by unsterilized syringe	
Contact with Tuberculosis patient Close / casual / Nil	
Examination	
Clubbing / Pallor / Cyanosis	Present / Absent
Temperature / Pulse rate / B.P. / JVP / RR	
Systemic Examination	
Respiratory	(i) CVS (ii) CNS (iii) Musculoskeletal (iv) Abdominal

CLINICO – RADIOGRAPHIC PRESENTATION

a. Acino nodular shadows	Present/ Absent
b. Nodular Lesions with satellite lesion	Present/ Absent
c. Cavity	Present/ Absent if Present ½ Multiple Thin walled / thick walled smoth lining / rough both . air fluid level Present/ Absent
d. Consolidation	Present/ Absent if Present whole lung Right/Bronchogram Present/ Absent
e. Atalectasis	Present/ Absent . Whether consolidation – Collapse . Present/ Absent
f. Fibrosis	Present/ Absent. If present whole lung (Right/ Left)
g. Bronchectesis	Present/ Absent
h. Mediastinal Lymadenopathy	Present/ Absent
i. Non Cavitary Local Focal Infiltrates	Present/ Absent
j. Lower Lung field infiltration	Present/ Absent
k. Miliary Shadows	Present/ Absent
l. Pleural Effusion	Present/ Absent. If present U/I (Right/ Left) B/L pleural fibrosis Present/ Absent

INVESTIGATION

a. Laboratory

Urine

Sputum for AFB Examination

Mantoux Test by 5 TU

Other Investigations

LFT/ Renal Function Test/ CSF/ Ascitic Fluid

ELISA IMMUNO COMB

FNAC (Biopsy)

b. Radiological

X-ray Chest P/A View

Plane X- ray A/P , Lateral

X-ray KUB

U/S Scan Abdomen

CT Scan , ECG , Echo

(*) = As and when required

Ilb % TLC DLC P L E M B

RE ME Sugar Protein

(*)

(*)

(*)

(*)

(*)

(*)

(*)

(*)

Dr. Vinod Kumar